

Work Order ID 59974

Tuesday, June 22, 2010 10:15:00 AM



SCRAP

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Item ID: D206-667-203

Revision ID:

Item Name: Crosstube Aft

Start Date: 6/22/2010 Start Qty: 1.00

Required Date: 7/20/2010 Req'd Qty: 1.00

Reference:

Approvals: Process Plan: *M*

Date: *10-6-22* Tooling:

QC:

Date: SPC (Y/N):

Cust Item ID:

Customer:

Setup Start

Stop

Run Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D206-667-243	Rev C								
100		0.00							
	DOCUMENT CONTROL								
DC	Memo	0.00							
Document Control	Photocopy bluefile and create labels as per PPP D206-667-203 CHG003								
110		0.00							
	BENDING MACHINE - CROSSTUBES								
CNC Bend 2	Memo	0.00							
CNC Alpha 160 Bender	Bend tube as per Dwg D206-667-243 using CNC bender program 206L-AF								
120		0.00							
	QC15- Crosstube Dimensional Check								
QC	Memo	0.00							
Quality Control									

Q *(1)* MB 10-07-06
P10-7

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D206-667-203 PAR #: _____ Fault Category: cross tubes. NCR: Yes No DQA ✓ Date: 10-07-08
 Resolution: Scrap Disposition: Scrap QA: N/C Closed: ✓ Date: 10-07-08

NCR: 59974		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
10/07/08	#110	tube was crushed in Bender about 12" from cuff on engine of Bender. operator was on approach while helper was placing buggy and tube dropped between rollers. R.L. lack of communication and attention HOT!	W 10-07-08	→ tube is not not salvageable. Scrap & Destroy no replace	MB 10-07-08	8 10/07/08	W 10-07-08	8 10/07/08
					MB 10-07-08			8 10/07/08
					MB 10-07-08			8 10/07/08

NOTE: Date & initial all entries

Work Order ID 59974

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Item ID: D206-667-203

Accept

Revision ID:

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Start Date: 6/22/2010 Start Qty: 1.00

Required Date: 7/20/2010 Req'd Qty: 1.00

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Setup Start

Stop

Run Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130	Crosstubes	0.00							
Crosstubes	Memo	0.00							
Crosstubes	1-Drill pilot holes in tube using drill Jig DT8583 & DT8584 as per Dwg D206-667-243 and drill table DT8577. Locate hole #6 for towers as per QSI 10. Drill all (3) top holes.								
	2-Drill and Ream all holes in tube to finish size using drill Jig DT8583 & DT8584 as per Dwg D206-667-243 Check dimensions between holes on all four sides.								
	3-Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins.								
	4-Drill pilot holes using drill Jig DT8583 & DT8584 as per Dwg D206-667-243. Drill only the top (2) holes.								
	5-Drill & ream the top (2) holes to finish size using drill Jig DT8583 & DT8584 as per Dwg D206-667-243								
	6-Drill Fwd rivet holes using drill Jig DT8789 FWD as per Dwg D206-667-143. Note: Fwd side has 3x top holes.								
	7-Drill Aft rivet holes using drill Jig DT8789 as per Dwg D206-667-243.								
	8-C'sink holes as per Dwg D206-667-243.								
	9 -Scribe part # and batch # using vibrating stylus as per Dwg D206-667-243 Inside of Cuff (Do not engrave on outside of tube)								
	10 -Deburr & Inspect for surface damage. Repair damage within limits as per								

SCRAP

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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Required Date: 7/20/2010 Req'd Qty: 1.00

Reference:

Cust Item ID:

Customer:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start
Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
	Dwg D206-667-243								
140	Crosstubes Chemical Conversion	0.00							
	HandFXtube	0.00							
	Hand Finishing Crosstubes								
150	QC3- Inspect Part Finish	0.00							
	QC	0.00							
	Quality Control								
160	QC5- Inspect part completeness to spec on W/O	0.00							
	QC	0.00							
	Quality Control								

SCRAP

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Item ID: D206-667-203

Accept



Setup Start



Revision ID:

Item Name: Crosstube Aft

Stop



Start Date: 6/22/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 7/20/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursTool ID Tool # Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

170



Outsource2

Outsource process - NDT per QSI038 4.1

0.00

Memo

0.00

Liquid Penetrant Inspection as per QSI 038Or
Issue P/O: _____
LPI as per ASTM 1417
Level 2 Attach copy of NDT results to work order

180



Packaging

Packaging

0.00

Memo

0.00

Ensure copy of NDT results attached to work order.

190



QC

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

Ensure results are as per Dwg D206-667-243

Quality Control

SCRAP

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Item Name: Crosstube Aft

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Required Date: 7/20/2010 Req'd Qty: 1.00

Reference:

Cust Item ID:

Customer:

Setup

Start

Stop

Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run

Start

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

200



SprayPaint

Spray Painting

SprayPaint

Memo

0.00

1-Prime inside and outside crosstube as per QSI 005 4.2
2-Paint outside crosstube with White Imron as per QSI 005 4.2

PRIME:

Start Time: _____

Finish Time: _____

PAINT:

Start Time: _____

Finish Time: _____

210



QC

Quality Control

QC14- Inspect Spray Paint

Memo

0.00

Wrap in plastic bag to protect from scratches

SCRAP

W/O:		WORK ORDER CHANGES						
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Item ID: D206-667-203

Accept



Setup Start



Revision ID:

Item Name: Crosstube Aft

Stop



Start Date: 6/22/2010 Start Qty: 1.00



Required Date: 7/20/2010 Req'd Qty: 1.00

Cust Item ID:

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool # Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

220



Crosstubes

Crosstubes

0.00

Memo

0.00

1-Install nut plates as per Dwg D206-667-243.

230



Crosstubes

Skidtubes

0.00

Memo

0.00

1-Install support using 0.03" to 0.06" thick layer of magnobond 6398 per QSI 015. Let cure for 12h after installation and prior to packaging. Note: (3) top holes should be facing up.
A/R Magnobond 6398 : _____

2-Install supports and clamps as per Dwg D206-667-243. Torque clamps to 80-100 in lb

SCRAP

W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Reference:

Cust Item ID:

Customer:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

240



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

250



Packaging

Packaging

Pick Kit

0.00

Memo

0.00

260



QC

Quality Control

QC4- 100% Inspect kits for completeness

0.00

Memo

0.00

SCRAP

W/O:		WORK ORDER CHANGES					
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Start Date: 6/22/2010 Start Qty: 1.00

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Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Setup Start
Stop

Run Start
Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
270 Packaging	Packaging	0.00							
	Memo Identify and pack for shipping as per PPP D206-667-203 Location: _____ PPP Rev: _____	0.00							
280 QC	QC21- Final Inspection - Work Order Release	0.00							
Quality Control	Memo	0.00							

SCRAP

MF
10-7-7

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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NOTE: Date & initial all entries

Picklist Print

Tuesday, June 22, 2010 10:15:04 AM

Page 1

Work Order ID: 59974

Parent Item: D206-667-203

Parent Item Name: Crosstube Aft




Start Date: 6/22/2010

Required Date: 7/20/2010

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:F 05.09.01 Add holes for compatibility with Bell Skidtubes KJ/JLM
 IPP Rev:G 08-06-03 update as per DSI9415 (ECN1198) DD verified by:ec
 IPP Rev:H 08-07-18 remove thread masking in step 12 DD verified by:EC
 IPP Rev:I 08-12-15 add magnobond DD verified by:EC
 IPP Rev J 09.01.06 ECN 08-562 EC verified by:DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
AN960JD516 	NAS1149D0563J	Purchased	No			100	Each	0.0000	18	18			
Washer D206-667-203TRN 		Manufactured	No			220	Each	3.0000	1	1			
Crosstube Turning Detail													
<div> <div>Location</div> <div>Loc Qty</div> <div>Loc Code</div> </div>													
<div> <div>LG</div> <div>3</div> <div></div> </div>													
<div> <div>53649</div> <div>1</div> <div></div> </div>													
<div> <div>53651</div> <div>1</div> <div></div> </div>													
<div> <div>59144</div> <div>1</div> <div></div> </div>													
D2873-043 		Manufactured	No			220	Each	48.0000	2	2			
Nut Plate Assembly													
<div> <div>Location</div> <div>Loc Qty</div> <div>Loc Code</div> </div>													
<div> <div>LG</div> <div>48</div> <div></div> </div>													
<div> <div>53966</div> <div>20</div> <div></div> </div>													
<div> <div>56466</div> <div>8</div> <div></div> </div>													
<div> <div>57337</div> <div>20</div> <div></div> </div>													

SCRAP

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Work Order ID: 59974

Parent Item: D206-667-203

Parent Item Name: Crosstube Aft

Start Date: 6/22/2010

Required Date: 7/20/2010

Start Qty: 1.00

Required Qty: 1.00

D2873-045

Manufactured No

220 Each

44.0000

2 2



Nut Plate Assembly

Location

Loc Qty

Loc Code

LG	44
53967	5
53968	20
57336	19

D2892-1

Manufactured No

230 Each

52.0000

2 2



Support

Location

Loc Qty

Loc Code

LG	52
41986	12
42785	20
53124	13
55787	7

D3595-063-450

Manufactured No

230 Each

74.9790

4 4



RUBBER CUSHION

Location

Loc Qty

Loc Code

LG	74.97897368
53775	5.97897368
58161	24
59580	45

SCRAP

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Shop Packet Print

Page 2

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Work Order ID: 59974

Parent Item: D206-667-203

Parent Item Name: Crosstube Aft

Start Date: 6/22/2010

Required Date: 7/20/2010

Start Qty: 1.00

Required Qty: 1.00

MS20601-AD4W10

Purchased

No

230

Each

128.0000

14

14



RIVET

Location

Loc Qty

Loc Code

LG051

100

114245

100

ST322

28

113220

28

AN5-10A

Purchased

No

260

Each

153.0000

10

10



Bolt

Location

Loc Qty

Loc Code

ST337

153

114199

52

114227

1

114752

100

AN5-32A

Purchased

No

260

Each

178.0000

4

4



Bolt

Location

Loc Qty

Loc Code

ST340

178

113121

28

114056

100

114405

50

AN5-34A

Purchased

No

260

Each

104.0000

4

4



Bolt

Location

Loc Qty

Loc Code

ST340

104

113149

54

113226

50

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Work Order ID: 59974

Parent Item: D206-667-203

Parent Item Name: Crosstube Aft



Start Date: 6/22/2010

Required Date: 7/20/2010

Start Qty: 1.00

Required Qty: 1.00

MS21042L5

Purchased No

260

Each

681.0000

4

4



Nut



Location

Loc Qty

Loc Code

ST139

500

114813

500

ST300

181

114449

181

Purchased No

260

Each

118.0000

4

4

MS21920-22



Clamp(per MIL-DTL-8783C)



Location

Loc Qty

Loc Code

LG

118

111210

19

114077

99

Scrap

SCRAP

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Page 4

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

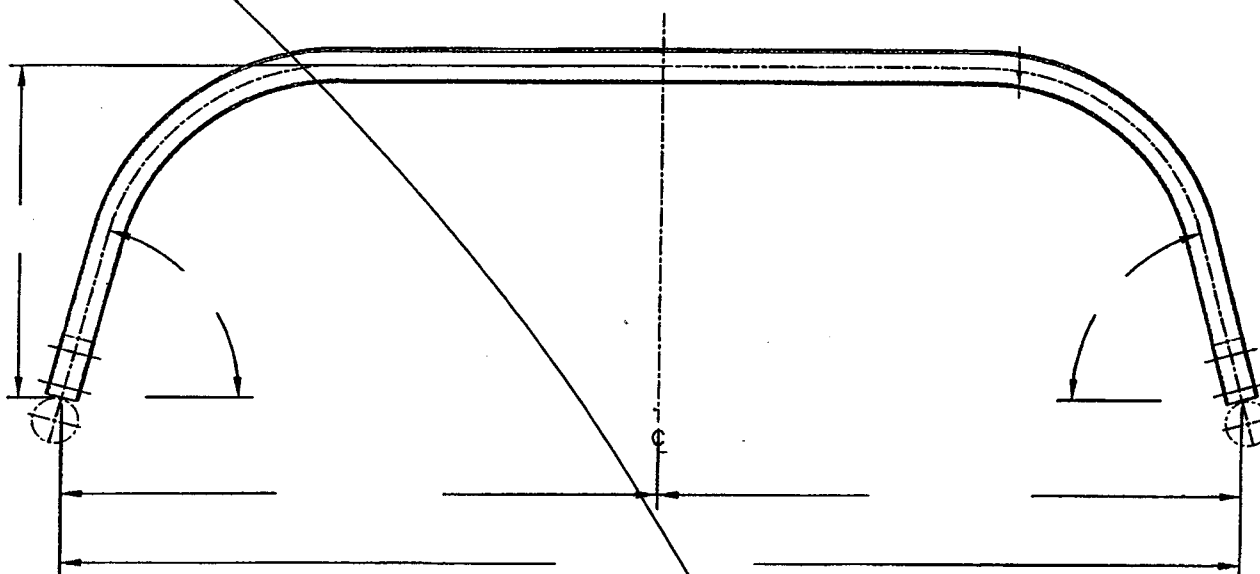
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order:	59979
Description: Crosstube High Aft (206L)	Part Number:	D206-667-203
Inspection Dwg: D206-667-243 Rev: C		Page 1 of 1

Required Dimension	Min	Max
Height	23.39	23.65
1/2 Span	41.79	42.05
Angle	54	56
Total Span	83.58	84.1



Comments
SCRAP

QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	09.11.17	Dwg Rev updated	KJ	
C	09.12.14	Dimensions update per Dwg Rev C	KJ	

W/O:			WORK ORDER CHANGES					
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				Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Item	Qty -243	Part Number	Description
1	X	D206-667-243	CROSSTUBE ASSEMBLY (206L HIGH AFT)
2	1	D6004-115	CROSSTUBE
3	2	D2873-043	NUT PLATE
4	2	D2873-045	NUT PLATE
5	2	D2892-1	SUPPORT
6	4	D3595-063-450	RUBBER CUSHION
7	4	MS21920-22	CLAMP
8	14	MS20601AD4W10	RIVET (OR NAS9302B-4-10)
9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299- 947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6004-115
FINISHED LENGTH = 104.91±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D206-667-243" AND BATCH NUMBER ON
INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 21.9 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT EDGE LONGITUDINALLY,
TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE
TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2892-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER
QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-22 CLAMPS WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE
D2892-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMP MECHANISMS ARE
LOCATED ON CROSSTUBE SUPPORTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN
SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

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NO. 39974
PS 10-6-22

RELEASED
06/11/2006

C	REVISE GENERAL NOTES/PART LIST (ZN D7-1); REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS. D3595-063-450 WAS D2856-400-773 (ZN D6-2 & A5-2); REMOVED REF. & ADD TOLERANCES (ZN 4-3, C5-3, D3-3); RELOCATED FLAG #6 (ZN A8-3) PER NCR 210; MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4.	RF	08.11.06
B	ADD HOLES AND NUT PLATES FOR COMPATABILITY WITH BHT/AA SKUDTUBES	PH	05.07.26
A	NEW ISSUE	CP	00.11.17
REV.	DESCRIPTION	BY	DATE
DESIGN	<i>RF</i>	DART AEROSPACE LTD	
DRAWN	<i>RF</i>	HAWKESBURY, ONTARIO, CANADA	
CHECKED	<i>RF</i>	DRAWING NO.	REV. C
MFG. APPR.	<i>RF</i>	D206-667-243	SHEET 1 OF 4
APPROVED	<i>RF</i>	TITLE	SCALE
DE APPR.	<i>RF</i>	CROSSTUBE ASS'Y (206L HIGH AFT)	NTS
DATE	08.11.06	COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

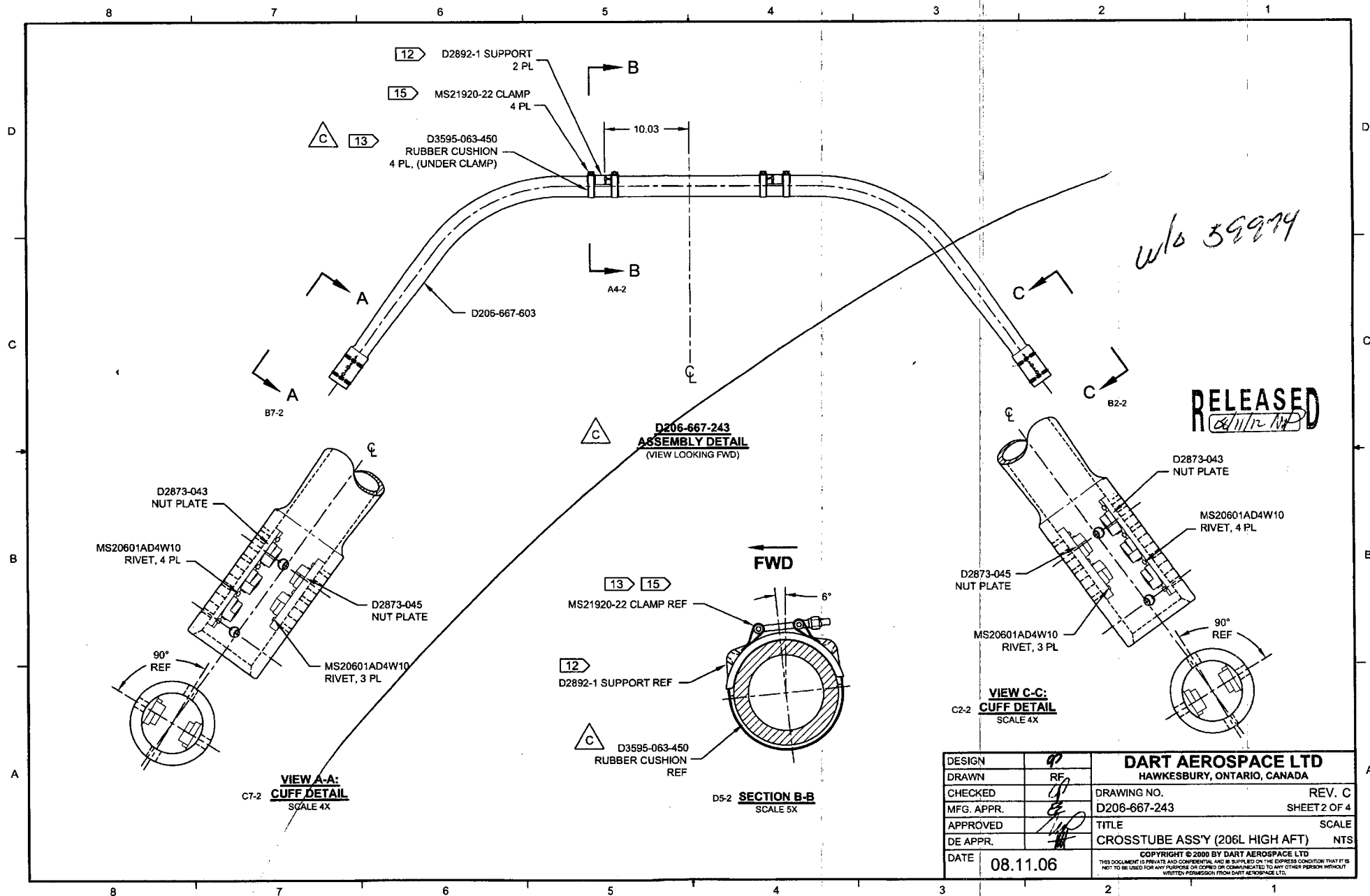
W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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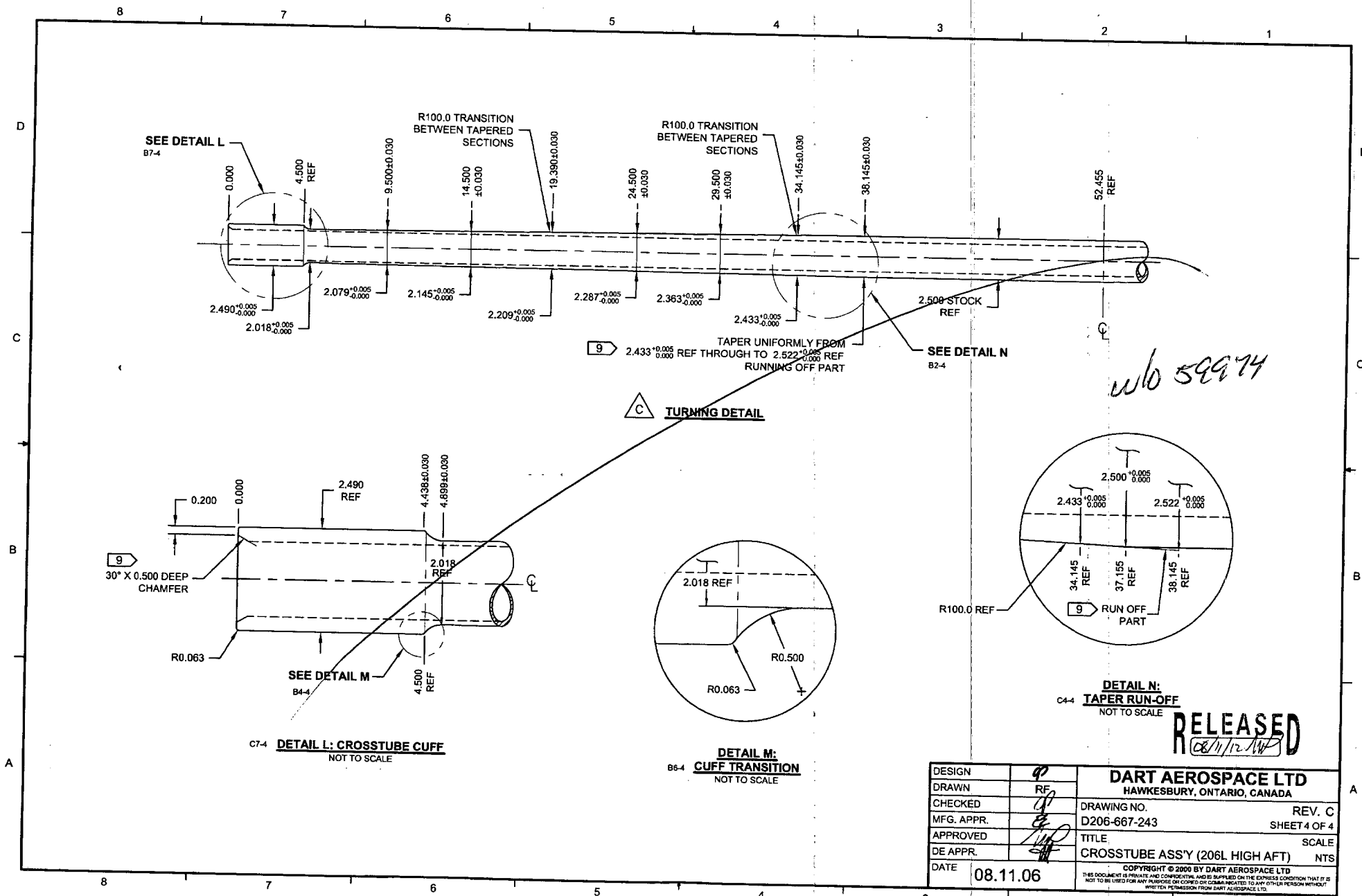
W/O:		WORK ORDER CHANGES						
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DESIGN	9	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	9	DRAWING NO.	REV. C
MFG. APPR.	9	D206-667-243	SHEET 4 OF 4
APPROVED	9	TITLE	SCALE
DE APPR.	9	CROSSTUBE ASS'Y (206L HIGH AFT)	NTS
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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